

Application No.: 10/671,289
Amendment and Response dated November 8, 2006
Reply to final Office Action of June 8, 2006
Docket No.: 903-86 RCE
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Remarks/Arguments:

Introduction

Claims 1-8 and 10-11 are pending. Claims 1-8, 10 and 11 are rejected. Claims 5, 6 and 8 are objected to for certain informalities. Claims 10 and 11 are rejected under 35 U.S.C. 112 second paragraph as being indefinite. Claims 1-6, 8 10 and 11 are rejected under 35 U.S.C. 102 (b). Claim 7 is rejected under 35 U.S.C. §103(a). New Claims 12 and 13 have been added.

Claim Objections

Claims 5, 6 and 8 are objected to for certain informalities. In response applicant has amended claims 5, 6 and 8 in accordance with the Examiners suggestion.

Section 112 Rejections

Claims 10 and 11 are rejected under 35 U.S.C. 112 second paragraph as being indefinite. In response applicant has amended claims 10 and 11 in accordance with Examiners suggestion.

Section 102 Rejections

Claims 1-6, 8 10 and 11 are rejected under 35 U.S.C. 102 (b) as being anticipated by U.S. Patent 5,614,008 to Escano. (hereinafter Escano). Applicants respectfully traverse.

With respect to the substrate the Examiner refers to column 12, lines 60-64 of Escano. There it is said that the inks of Escano are especially useful for printing invisible markings on various porous or semi-porous substrates, such as paper or paper products. There is no disclosure of a substrate having a polymeric receiving layer in Escano. This is also evident from the rejection under 35 U.S.C. paragraph 103 (a) of claim 7, which defines that the substrate has an ink receiving layer made from a swelling polymer. See also page 2, 1, 17-28 of the present application in view of the difference between a conventional (micro)porous substrate and a substrate having a polymer ink-receiving layer and the significance thereof.

Escano discloses inks, which contain a near infrared fluorophoric compound that is incorporated into a water-dissipatable polyester backbone. The emphasis on the water-dissipatable nature of these compounds is apparent throughout Escano. See e.g. col. 3, 1. 5-10 and col. 9, lines 61-63. These polymers form an aqueous colloid dispersion. According to column 1, lines 6-10 the aqueous ink formulations of Escano are suitable for various ink jet printing methods, such as drop-on-demand (DOD) and continuous printing methods. In view thereof Escano discloses *an* aqueous ink composition *having* a very broad composition with respect to the various components. However, it is clear from the specification that Escano clearly distinguishes different ink compositions for different ink jet printing techniques. See columns 3 and 4. In column 3, lines 14-30 an ink composition useful for drop-on-demand ink jet printing via a piezoelectric impulse method is disclosed. This composition comprises as component a) 1-10 weight percent water-dissipatable polyester having 0.1 ppm -- 1 weight percent fluorophoric compound; 45-75 weight percent humectant; 2-15 weight percent lower alcohol, small amounts of corrosion inhibitors and biocides, with the remainder being water. Lines 31-48 disclose a specific composition for drop-on-demand jet printing via the so-called bubble jet method. A composition for continuous ink jet printing is disclosed in column 3, lines 49-column 4-10, while column 4, line 11 ff discloses a specific composition for single nozzle continuous ink jet printing. Here it is emphasised that within the general composition as disclosed by Escano, Escano himself makes a distinction between various specific ink compositions for specific purposes.

The present invention deals with one printing technique only, that, is to say drop-on-demand ink jet printing of an ink having a specific composition comprising inter alia a water-soluble dye via the piezoelectric impulse method on a substrate having a polymeric ink-receiving layer. These features are clear from claim 1, which includes the following limitations:

- the drop-on-demand principle using *an* ink jet printing device, the print head of which is provided with a piezoelement for generating ink drops,
- the substrate provided with a polymeric ink-receiving layer

- the specific ink composition having a certain viscosity and comprising a water-soluble dye.

Thus claim 1 differs from Escano in at least two aspects, i.e. the polymeric ink-receiving layer of the substrate and the type of dyes. Therefore claim 1 is certainly novel over Escano. Similarly, the amended product claim differs from the ink composition *known* from Escano by at least the feature of the type of dyes.

Thus, Escano fails to disclose the subject invention as presently defined by independent claim 1. Therefore, reconsideration and withdrawal of the rejection of claim 1 and 8 under 35 U.S.C. §102(b), and all claims dependent therefrom, are respectfully requested.

Section 103 Rejections

Claim 7 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Escano in view of U.S. Patent No. 6,139,611 to Kovacs et al. (hereinafter "Kovacs"). Applicants respectfully traverse.

As acknowledged by the Examiner, Escano fails to disclose the substrate comprises a polymeric ink receiving layer made from a swelling polymer.

Conventional substrates of the microporous or open type are insufficient for proofing because of the poor colour stability (p. 2, 1. 17-20). As already said, Escano uses these kind of substrates as is evident from Escano, col. 12, 1. 60-64, mentioning "porous or semi-porous substrates, such as paper or paper products".

Now, the combination of piezo-DOD due to the better printing results and due to the longer service life of the piezoelement compared to a heating element in thermal-DOD and a substrate having a polymeric ink-receiving layer due to its favourable colour stability compared to

traditional substrates is desirable. However, although the combination might be desirable, the simple combination does not work well. The present invention provides the technical features for this combination, allowing a practically feasible printing method.

As explained on page 2, 1. 38 ff. piezo-DOD requires ink composition having a viscosity exceeding a lower limit (3 cP) in order to absorb the shock waves generated in the ink present in the printhead. Usually humectants are used for increasing the viscosity. Furthermore, humectants have the function of preventing inks from drying out during printing as well as during storage. However, a disadvantage of humectants is their low vapour pressure. Thus, humectants tend to reduce the drying rate after printing. This drying rate is important as a slow drying may allow mixing of the ink droplets applied by piezo-DOD on the substrate, thereby affecting the printing quality. Furthermore, when a slow drying ink is used, the printed substrate remains sticky for a relatively long period, thereby affecting further processing possibilities and time. Drying of water-based ink comprising water-soluble dyes is critical compared to drying of ink comprising an aqueous dispersion of colloid particles, because the mixing risk is lower in the latter.

Now the present inventors have surprisingly found that the method as defined in claim 1 using the ink composition as specified therein offers a delicate balance in colour stability, viscosity, stickiness and drying rate.

Such a method cannot be derived from Escano alone, nor in combination with Kovacs as the problem underlying the present invention is not touched upon by Escano. The same applies to the ink composition of the present *invention*. Thus claim 1 and claim 8 are not obvious over Escano in view of Kovacs. As all the remaining claims are dependent from patentable independent claims 1 or 8, these remaining claims are deemed to be allowable as well.

Specifically, according to claim 5 the ratio of the humectant to lower alcohol is between 0.10 and 1.50. The advantage of such a composition is explained on page 4, line 15 of the

specification as originally sent to you. Again a good balance in the ink properties regarding colour stability and drying rate is established. The method and composition as such according to the invention provide a delicate balance between the adverse effects of humectants and lower alcohols. See page 3, lines 7-22 in combination with page 4, lines 15-26.

Here it is emphasised that in the specific ink composition of Escano intended for piezo-DOD the ratio of humectant to lower alcohol is at least three, which is two times higher than claimed in the present invention.

Escano also describes specific piezo-DOD ink compositions in the examples. See examples 26 and 27. It is evident that the ratio of propylene glycol over n-propanol is at least ten in example 27 and about thirteen in example 26. This is one order of magnitude larger than in the ink composition of claim 5. Examiner to claim 7 the following comments are also provided. The ink composition of Escano is aimed at invisibly marking substrates like paper and paper products for subsequent identification, authentication, sorting and the like. See column 1, lines 14-16 and column 12, lines 57-column 13, line 4. In such applications the non-blocking characteristics and control of smudge resistance as disclosed by Kovacs do not apply at all. Furthermore, it is emphasized that in order to have these characteristics and resistance the image recording layer used by Kovacs contains various known additives including matting agents such as titanium dioxide, sink oxide, silicon and polymeric breads. There is no mentioning of swelling polymers for use in the ink-receiving layer. Thus there is no *incentive* to the skilled person to combine these teachings, and even in the case that Escano and Kovacs are combined the skilled person would not arrive at the present invention.

Accordingly, Escano and Kovacs, individually or in combination, fail to teach or suggest the invention as presently defined by claim 7. Reconsideration and withdrawal of the rejections of claims 7 are therefore respectfully requested.

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Therefore, reconsideration and withdrawal of the claim rejections under 35 U.S.C. §103(a) are respectfully requested because Escano and Kovacs, individually or in combination, fail to teach or suggest the present invention.

Summary

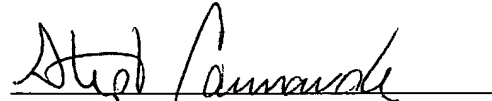
Therefore, Applicants respectfully submit that independent claims 1 and 8, and all claims dependent therefrom, are patentably distinct. This application is believed to be in condition for allowance. Favorable action thereon is therefore respectfully solicited.

Should the Examiner have any questions or comments concerning the above, the Examiner is respectfully invited to contact the undersigned attorney at the telephone number given below.

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The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 08-2461. Such authorization includes authorization to charge fees for extensions of time, if any, under 37 C.F.R. § 1.17 and also should be treated as a constructive petition for an extension of time in this reply or any future reply pursuant to 37 C.F.R. § 1.136.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Stephen Cannavale", is written over a horizontal line.

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